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ABSTRACT

The study investigated the relationship between characteristics of 35 preschool handicapped children and their developmental gains in an early intervention program. The specific characteristics that were examined included age at intervention, length of intervention, socioeconomic status, first born as compared to all other ordinal positions in birth, race, one or two children in a family versus three or more, sex, intact homes versus broken homes, and severity of handicapping conditions. The developmental areas that were measured included personal-social, gross motor, fine motor, language, and perceptuo-cognitive. The following results were significant at the .05 level: low socioeconomic level children made significantly larger gains on gross motor skills than middle to high socioeconomic level children; Black children made significantly larger gains than White children on the gross motor, language, and perceptuo-cognitive subscales; and boys made significantly larger gains than girls on gross motor and fine motor skills. No significant differences were obtained on the relationship of the other child characteristics and developmental gain. (Author)

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A COMPARATIVE PROFILE OF PRESCHOOL HANDICAPPED CHILDREN WHO PROFITED FROM EARLY IDENTIFICATION AND INTERVENTION

by

Frankie Stewart

Deweerd (1977) reports that providing educational services to preschool handicapped children and their families is reducing the number of children who will need intensive or long term help. There is an estimated one million children under 6 years of age in the United States today who are handicapped. With early help, the sooner the better, these children can often function at higher levels than had been dreamed possible in prior years.

Clausen (1972) states that from the beginning, each child presents a unique constellation of characteristics. These characteristics -- socioeconomic level, race, birth order, sex, number of siblings -- provide him with initial orientations. The child within this constellation of characteristics, develops ways of interpreting and responding to others. These characteristics affect the child's perception of school and peer group social settings.

There is considerable evidence to support the claim that early education programs can have some degree of effectiveness in assisting handicapped children in their total development. Bloom's (1964) analysis of hundreds of studies dealing with intelligence, aptitudes, achievement, personality, attitudes, and other variables reveal that most of these factors become stabilized early in life. Bruner (1960) also discussed the importance of early contact and structure. Studies of experimentally tested programs for the disadvantaged (Brieter & Englemann, 1966), mentally retarded (Karnes, 1969), and emotionally and

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socially handicapped (Maccoby & Zellner, 1970), suggests that early intervention can produce positive gains in most areas, but that the stability of these gains may vary according to the methods and procedures used.

The need for programs for preschool handicapped children has been substantiated. Research in this area has been extensive (Gray & Klaus, 1968; Karnes, 1969; McCandless & Spicker, 1971 and Weikart, 1967). Attention can now be turned to developing programs that can produce the most positive gains which will remain stable with the passage of time. Variables which need to be closely examined include age at intervention, length of intervention, socioeconomic status, race, family size, sex, intact home versus broken home, and severity of handicapping conditions.

A variety of early intervention programs exist for handicapped children (Tjossem, 1976). There is no one educational program that will be equally effective with all children. Therefore, we need data to assist in prescriptive educational programs that could allow us to better match each child and his unique characteristics to programs that provide the most promise for developmental gains.

PURPOSE OF STUDY

The purpose of this study was to investigate the relationship between child characteristics and developmental gains in an early intervention program that utilizes the Memphis Model. The specific characteristics that were examined included

age at intervention, length of intervention, socioeconomic status, first born as compared to all other ordinal positions in birth, race, one or two children in a family versus three or more, sex, intact homes versus broken homes, and severity of handicapping conditions. The developmental areas that were measured included personal-social, gross motor, fine motor, language, and perceptuo-cognitive.

REVIEW OF THE LITERATURE

Early childhood education for the handicapped has taken on major emphasis and impetus in the 1970's. Over 150 preschool model centers for the handicapped have been established across the country (Anastasiow, 1975). Review of the research on determining the effects of early intervention has definitely shown gains with young handicapped children. Recent research has focused on a search for models to help determine the types of intervention that are most effective in producing developmental gains (Karnes, 1973).

Bissell (1973) reports that the importance of evaluating these gains over a long period of time to see if they were maintained became evident as reports came back from the public school systems indicating that children who made large gains in preschool programs were not sustaining these gains when they entered public schools. Thus, a Follow Through program was initiated and was designed to follow children who had previously been enrolled in Head Start programs, and to aid in their continued development. The major focus was on evaluating different types of programs, teachers, and sites, as opposed to examining the differential characteristics of the children in these programs.

The present study will concentrate on investigating the relationship between child characteristics and developmental gains in an early intervention program that utilizes the Memphis Model.

The generally accepted views of the 1920's and 1930's were that an infant developed according to an innate maturational blueprint. Any attempts to train him before he was "ready" would be in vain, and might well be harmful to the child. The baby would develop at a fixed rate and should be allowed to progress at his own inherent pace (Braun & Edwards, 1972).

Dramatic studies during the 1930's began to challenge the concept of the fixed IQ. These studies under the leadership of Howard Skeels were some of the earliest research efforts to demonstrate the effects of environment on early cognitive growth. Skeels published the results of his most dramatic study in 1939. Thirteen mentally retarded children from 1 to 2 years of age were moved from a non-stimulating institution, to one which provided ample stimulation through an individualized relationship with adults. The mean IQ of this experimental group was 64.3. The contrast group was composed of 12 children with a mean IQ of 86.7, who remained in the non-stimulating institution. The major finding after a two year period, was that the mean intelligence level of the experimental group increased 27.5 points, and the contrast group showed a mean loss of 26.2 points (Skeels & Dye, 1939). A follow-up was done after 21 years and Skeels was able to contact 100% of the subjects. All of the experimental group were self supporting and the median educational grade completed was 12. In the contrast group, five remained wards of state institutions, the group's median level of educational

achievement was third grade, only 50% were employed, and all but one were unskilled laborers (Skeels, 1965).

Despite the early work of Skeels and others, the evidence that existed to substantiate early environmental stimulation was generally considered non-conclusive by those who supported the assumptions that intelligence was fixed and development was predetermined (Hunt, 1971). Major shifts in opinion were observed in the 1950s as evidence for the responsiveness of intelligence to experience was accumulated by psychologists, J. McVicker Hunt at the University of Illinois, Benjamin Bloom at the University of Chicago, and Jerome Bruner at Harvard (Brown & Edwards, 1972). Frost (1968) states that the notion of innately fixed intelligence was finally effectively buried by J. McVicker Hunt as he presented a documented case for the flexibility of intelligence and the importance of experience in effecting developmental change in his book, Intelligence and Experience, published in 1961. Hebb (1949) presented a new concept when he discussed the effect of early perceptual learning on intellectual development. Piaget (1947) analyzed successive stages in the intellectual development of children beginning with early sensory motor development. Hunt (1961) combined these ideas with concepts based on cybernetics and information theory and produced an account of the way in which the experience of the growing child enters into his intellectual development.

METHOD

The population studied was composed of 35 students who attended a private school for preschool handicapped children. The chronological ages of these children ranged from 2 to 7 years, and the developmental ages ranged from 6 months to 5 years. Approximately 65% of the children were white and 35% were black, 38% were female and 62% were male.

The intervention program was patterned after the Memphis Model. There are four components of the model, including the Memphis Comprehensive Developmental Scale, the Developmental Skill Assignment Record, the Continuous Record for Educational Developmental Progress, and the Lesson Plans. The first step in the cycle is to determine the child's present level of developmental functioning using the Memphis Comprehensive Developmental Scale. Individual program planning is next, and is accomplished with the results of the evaluation on the developmental scale. The third component, the Continuous Record for Educational Developmental Gain, monitors the teaching process. The Lesson Plans, which are the fourth component, guide the teaching process.

The faculty was composed of a director, two teachers, two aides, and several volunteers. The ratio of children to adults was three to one.

The school day was divided into two sessions; one beginning at 8:30 and ending at 11:00, the other beginning at 12:00 noon and ending at 2:30. There were two morning and two afternoon classes, with eight or nine students per class.

The teachers of each class administered the Memphis Comprehensive Developmental Scale to each child approximately two weeks after the beginning of school. The same developmental scale was administered by the teachers of each class approximately two weeks prior to the end of school. The children who reached a ceiling at post testing in one or more of the five areas being evaluated were further tested to determine their current levels of functioning.

ANALYSIS

A *t* test of gain scores was utilized to determine if the hypotheses were to be retained or rejected. The dependent variables were further subjected to correlation analysis to try to detect any trends.

RESULTS

The relationship between eight child characteristics and developmental gain in an early intervention program was examined.

Hypothesis 1: Children who begin intervention prior to age 2 will make greater gains in an early intervention program than children who begin intervention after age 2. There were no significant differences found in the *t* test analysis for subscale gain and total gain ratio presented in Table 1. Therefore, Hypothesis 1 is rejected.

Hypothesis 2: There will be no difference in developmental gains made by children who are in an early intervention program

TABLE 1

t Test Analysis of Gain Scores of Children who Received Intervention Prior to Age 2 (N = 9) and After Age 2 (N = 24)

Subscale	Mean Gain	SD	DF	t value	Level of sig.
Personal Social					
Before Age 2	9.33	4.84	31	-.38	.706
After Age 2	10.25	6.55			
Gross Motor					
Before Age 2	10.33	7.76	31	-1.50	.143
After Age 2	14.29	7.30			
Fine Motor					
Before Age 2	6.33	3.16	31	-1.17	.251
After Age 2	8.87	6.18			
Language					
Before Age 2	10.66	5.63	31	-.78	.439
After Age 2	12.33	5.36			
Perceptuo-Cognitive					
Before Age 2	9.66	5.95	31	-.38	.707
After Age 2	10.41	4.71			
Total					
Before Age 2	1.41	.317	31	1.21	.236
After Age 2	1.32	.143			

for the first year, as compared to children who have been in an early intervention program for longer than one year. The t test analysis for subtest and total gain ratio are presented in Table 2. There were no significant differences found for this population of children; therefore, Hypothesis 2 is retained.

Hypothesis 3: There will be no difference in developmental gains made by children from middle to high socioeconomic levels as compared to children from a low socioeconomic level in an early intervention program. The t test analysis for subtest and total gain ration are presented in Table 3. There was a significant difference in developmental gain in the gross motor area for this population related to socioeconomic level. Therefore, the null hypothesis was rejected at the .05 level of significance.

Hypothesis 4: There will be no difference in developmental gains made by first born children as compared to all other positions in birth order in an early intervention program. The t test analysis for subtest and total gain ratio are presented in Table 4. There were no significant differences found for this population of children. Therefore, the null hypothesis was retained.

Hypothesis 5: There will be no difference in developmental gains between black and white children in an early intervention program. There were significant differences found for this population of children. The t test analysis is presented in Table 5. The null hypothesis was rejected at the .05 level of significance.

Hypothesis 6: There will be no difference in developmental gains made by children in a family of one or two children as compared to a family with three or more children in an early intervention

TABLE 2

t Test Analysis of Gain Scores of Children who were in an Intervention Program for the First Year (N = 5) and for Longer than One Year (N = 28)

Subscale	Mean Gain	SD	DF	t value	Level of sig.
Personal Social					
First Year	11.40	3.91	31	.55	.584
Longer than 1 yr.	9.75	6.40			
Gross Motor					
First Year	13.20	5.44	31	-.00	.997
Longer than 1 yr.	13.21	7.18			
Fine Motor					
First Year	10.80	6.57	31	1.14	.262
Longer than 1 yr.	7.71	5.40			
Language					
First Year	12.60	8.04	31	.32	.751
Longer than 1 yr.	11.75	4.98			
Perceptuo-Cognitive					
First Year	13.00	6.04	31	1.37	.180
Longer than 1 yr.	9.71	4.74			
Total					
First Year	1.43	.150	31	1.03	.311
Longer than 1 yr.	1.43	.211			

TABLE 3

t Test Analysis of Gain Scores of Children from Middle to High Socioeconomic Levels (SEL) and Children from a Low Socioeconomic Level (SEL)

Subscale	Mean Gain	SD	DF	t value	Level of sig.
Personal Social					
Low SEL **	12.81	5.86	31	1.97	.058
Middle-High SEL ***	8.59	5.80			
Gross Motor					
Low SEL	18.45	7.65	31	3.64	*.001
Middle-High SEL	10.59	4.74			
Fine Motor					
Low SEL	9.36	7.01	31	.85	.399
Middle-High SEL	7.59	4.80			
Language					
Low SEL	14.09	7.55	31	1.71	.097
Middle-High SEL	10.77	3.66			
Perceptuo-Cognitive					
Low SEL	12.45	6.18	31	1.89	.068
Middle-High SEL	9.09	3.98			
Total					
Low SEL	1.40	.171	31	1.10	.281
Middle-High SEL	1.32				

* Significant beyond the .05 level.
** Low SEL, N = 11
*** Middle-High SEL, N = 22

TABLE 4

t Test Analysis of Gain Scores of First Born Children (N = 17) Compared to Children of All Other Positions in Birth Order (N =16)

Subscale	Mean Gain	SD	DF	t value	Level of sig.
Personal Social					
First born	10.23	5.20	31	.23	.823
All other	9.75	7.05			
Gross Motor					
First born	13.35	5.51	31	.12	.906
All other	13.06	8.27			
Fine Motor					
First born	8.05	5.20	31	-.13	.899
All other	8.31	6.15			
Language					
First born	11.47	5.63	31	-.44	.662
All other	12.31	5.28			
Perceptuo-Cognitive					
First born	10.17	4.53	31	-.04	.967
All other	10.25	5.60			
Total					
First born	1.33	.134	31	-.35	.726
All other	1.36	.263			

TABLE 5

t Test Analysis of Gain Scores of White Children (N = 22) Compared to Black Children (N = 11)

Subscale	Mean Gain	SD	DF	t value	Level of sig.
Personal Social					
White	8.59	5.50	31	-1.97	.058
Black	12.81	6.44			
Gross Motor					
White	10.36	4.69	31	-4.12	*.000
Black	18.90	7.17			
Fine Motor					
White	7.09	4.94	31	-1.62	.114
Black	10.36	6.39			
Language					
White	10.36	3.55	31	-2.45	*.020
Black	14.90	7.18			
Perceptuo-Cognitive					
White	8.59	3.50	31	-.293	*.006
Black	13.45	6.07			
Total					
White	1.27	.107	31	-3.15	*.004
Black	1.48	.277			

* Significant at the .05 level.

program. The t test analysis for subtest and total gain ratio are presented in Table 6. Increasing numbers of children in a family was not related to developmental gain. Therefore, the null hypothesis was retained.

Hypothesis 7: There will be no difference in developmental gains between boys and girls in an early intervention program. The t test analysis for subscale and total gain ratio are presented in Table 7. There were significant differences found for this population. The null hypothesis was rejected at the .05 level of significance.

Hypothesis 8: There will be no difference in developmental gains made by children from intact homes as compared to children from broken homes in an early intervention program. The t test analysis for subtest and total gain ratio are presented in Table 8. There were no significant differences found for this population of children. Therefore, the null hypothesis was retained.

Other findings not limited to specific hypotheses indicated (a) that there was a high correlation between the language and perceptuo-cognitive subscales (s=.001), (b) that the correlation among other subscales was low, (c) that the perceptuo-cognitive subscales was the greatest predictor of total gain with this population of children, (d) that the highest mean gain for the entire population was 11.87 months in language skills, (e) that the lowest mean gain for the entire population was 8.18 months in fine motor skills.

CONCLUSIONS

The conclusions drawn from this study took into consideration the small number of subjects in the population studies (N=33). The data supports the following conclusions.

TABLE 6

t Test Analysis of Gain Scores of Children in a Family with One or Two Children (N = 20) Compared to a Family with Three or More Children (N = 13)

Subscale	Mean Gain	SD	DF	t value	Level of sig.
Personal Social					
1 or 2 children	10.35	5.79	31	.40	.688
3 or more children	9.46	6.69			
Gross Motor					
1 or 2 children	11.80	4.88	31	-1.49	.146
3 or more children	15.38	8.94			
Fine Motor					
1 or 2 children	7.60	3.73	31	-.74	.467
3 or more children	9.07	7.74			
Language					
1 or 2 children	11.55	5.61	31	-.43	.671
3 or more children	12.38	5.23			
Perceptuo-Cognitive					
1 or 2 children	10.00	4.90	31	-.30	.768
3 or more children	10.53	5.31			
Total					
1 or 2 children	1.36	.233	31	.68	.499
3 or more children	1.31	.154			

TABLE 7

t Test Analysis of Gain Scores of Boys (N = 20) and Girls (N = 13)

Subscale	Mean Gain	SD	DF	t value	Level of sig.
Personal Social					
Boys	10.95	6.25	31	1.12	.272
Girls	8.53	5.72			
Gross Motor					
Boys	15.35	7.52	31	2.37	*.024
Girls	9.92	4.13			
Fine Motor					
Boys	9.90	5.79	31	2.34	*.026
Girls	5.53	4.21			
Language					
Boys	11.35	5.32	31	-.69	.494
Girls	12.69	5.63			
Perceptuo-Cognitive					
Boys	9.95	4.72	31	-.37	.715
Girls	10.61	5.56			
Total					
Boys	1.32	.131	31	-.85	.403
Girls	1.38	.286			

* significant beyond the .05 level.

TABLE 8

t Test Analysis of Gain Scores of Children from Intact Homes (N = 28) Compared to Children from Broken Homes (N = 5)

Subscale	Mean Gain	SD	DF	t value	Level of sig.
Personal Social					
Intact Homes	10.39	6.19	31	-.88	.388
Broken Homes	7.80	5.44			
Gross Motor					
Intact Homes	12.50	6.79	31	1.43	.163
Broken Homes	17.50	6.61			
Fine Motor					
Intact Homes	8.17	5.02	31	.01	.994
Broken Homes	8.20	8.92			
Language					
Intact Homes	11.53	5.16	31	.86	.396
Broken Homes	13.80	6.90			
Perceptuo-Cognitive					
Intact Homes	9.85	4.75	31	.96	.342
Broken Homes	12.20	6.45			
Total					
Intact Homes	1.35	.213	31	-.34	.735
Broken Homes	1.32	.163			

Children who began intervention prior to age 2 did not make significantly greater gains than children who began intervention after age 2. The trend of the data is indicative of greater gains prior to age 2 but is not significant for this population.

Different lengths of time in training in an early intervention program made no significant difference in the amount of gain made during the treatment period (8.5 months). There was no significant difference between the amount of gain made by children in an intervention program for the first year and children who had been in an intervention program for longer than one year. Therefore, longer intervention failed to enhance the gains made with this population.

Socioeconomic level did make a difference in developmental gain in an early intervention program. Low socioeconomic level children made significantly larger gains on gross motor skills than middle to high socioeconomic level children. There were no significant differences on the other subscales.

Birth order was not related to developmental gain in an early intervention program. The data supports the conclusion that first born children will not make significantly larger gains in an early intervention program than children in all other positions in birth order.

Black children made significantly larger gains than white children on the gross motor, language, and perceptuo-cognitive subscales. The differences were not significant on the other two scales, however, the difference approached significance on the personal-social subscales (s=.056). The entire black population in the study was from a low socioeconomic level, which indicates a deprived environment. The tentative conclusion can be made that when children enter an intervention program from a deprived background, they will make more rapid gains in the new stimulating environment.

The number of children in a family did not make a significant difference related to gain scores. With this population, there was no relationship established between development gains in an early intervention program and number of children in a family.

Boys made significantly larger gains than girls on gross motor and fine motor skills. Sex did make a difference in developmental gain in an early intervention program with this population.

There was no relationship established between developmental gains made in early intervention program and intact homes versus broken homes. With this population, being from an intact compared to a broken home made no significant difference.

RECOMMENDATIONS

The findings of this study revealed that all of the children made developmental gains in an early intervention program. Further

studies should be conducted comparing two or more intervention programs to amount of gain made to determine if one type of intervention is superior to another for children with certain differential characteristics.

Children who made significantly larger gains in this study were either from a low socioeconomic level, were black, or were boys. Further studies should be conducted with a larger sample size to see if this could be replicated.

While this study presented evidence that there was no significant difference in gains made based on age at intervention, previous studies have shown that age at intervention did make a difference. Therefore, it is recommended that further studies be conducted on effect of age at intervention.

Thompson (1974) states that research pertaining to IQ and family size has consistently shown trends toward an inverse relationship. The present study presented evidence that there was no significant difference in gains made with increasing numbers of children in a family. It is recommended that further studies be conducted on the relationship between developmental gains in an early intervention program and the number of children in a family.

Due to evidence presented in the present study, it is recommended that there should be no differential early intervention program for children based on length of intervention, birth order, or intact homes versus broken homes.

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